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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF MISSISSIPPI
GREENVILLE DIVISION
Civil Action No.: 4:20-cv-00021-DMB/JMV

In the matter of ANDREW ALEXANDER et al, Plaintiffs,

vs.

PELICIA E. HALL, et al, Defendants.

EXPERT REPORT OF PHILIP J. CROSS, PH.D.

OCTOBER 24, 2023

A handwritten signature in cursive script, appearing to read "Phil Cross", is positioned above a horizontal line.

Philip J. Cross

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I. INTRODUCTION

A. My Qualifications

1. I am principal and founder of Kenyon Consulting LLC, an economic and statistical consulting firm. I hold a PhD in economics from the University of Wisconsin – Madison. I have previously worked for several global consulting firms, including AlixPartners, Berkeley Research Group, and Deloitte Financial Advisory Services. I previously taught in the Economics Department at Georgetown University and have held visiting academic positions in the Economics Departments of Johns Hopkins University and the University of Melbourne.
2. My consulting experience includes working on matters involving the computation of economic damages of a pecuniary and non-pecuniary nature incurred because of allegedly illegal behavior. I have worked on such matters in litigation contexts both on the Plaintiff side and on the Defense side. For example, in 2022 I opined for the Plaintiffs in a class action matter regarding probation supervisees in Alabama where allegedly illegal actions by the probation services provider resulted in unduly onerous and lengthy probation stints.

B. Assignment

3. I have been retained by counsel for Defendants in the above captioned litigation. My report critiques and rebuts the August 24, 2023, expert report of Jonathan Shefftz (the “Shefftz Report”) which opines as to methodologies for computing pecuniary and non-pecuniary

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damages allegedly suffered by putative Class members as a result of allegedly “being confined in conditions which pose serious and imminent dangers to their safety and well-being.”¹

C. Grounds for Opinions and Materials Reviewed

4. I rely upon my education, training and experience as an economist, as well as other grounds stated in this report.
5. I have reviewed the Shefftz Report and documents referred to in the Shefftz Report, including the Fifth Amended Complaint, March 16, 2021 (“the Complaint”). Additionally, I have relied upon these documents:
 - i. Guido Matias Cortes & Eliza Forsythe, “Heterogeneous Labor Market Impacts of the COVID-19 Pandemic”, *ILR Review*, vol.76(1), pp30-55, 2023.
 - ii. Consumer Expenditure Surveys, *U.S. Bureau of Labor Statistics*, September 2023.
 - iii. Martha Ross, Nicole Bateman & Alec Friedhoff, *Meet the Low-Wage Workforce*, Brookings, 2020.
 - iv. Order and Memorandum Opinion, March 22, 2023.

¹ Section 1, p2, of Complaint.

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- v. Inmate details from the Mississippi Department of Corrections (“MDOC”) website (MDOC Inmate Records 000892-913).

D. Summary of My Opinions

6. The Court has previously “narrowed the scope of this lawsuit to a potential Eighth Amendment violation—with recoverable damages limited to those of a nominal and punitive nature.”² Unless the Court changes this scope, the Shefftz Report and this report – dealing with the purported methodologies for computing pecuniary and non-pecuniary damages, both of which are categories of compensatory damages – are presumably moot.
7. The Shefftz Report contains numerous inaccuracies, noncredible assumptions and biased calculations. As a consequence, the methodologies for computing damages outlined in the report are unreliable and should be ignored by the Court. The deficiencies in the Shefftz Report include:
 - i. An erroneous count of putative Class members,
 - ii. A list of inmate attributes claimed to be sufficient to compute damages that is, in fact, inadequate and incomplete – in particular, attributes that identify which Class members suffered injuries entitling them to pecuniary or non-pecuniary damages, and to which of the Defendants any such damages can be attributed,

² Order and Memorandum Opinion, March 22, 2023

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- iii. A pecuniary damages methodology that is unreliable as it invokes noncredible assumptions about (a) expected release date, (b) the post-release worklife of inmates, (c) the post-release employment rate of inmates, (d) employed inmates working full-time full-year post-release, (e) self-consumption rates of low-income inmates post-release, and (f) a lack of impact of COVID-19 on inmates' post-release employment prospects, and
- iv. A non-pecuniary damages methodology that is unreliable as it is based on (a) an inappropriate comparison with a set of "awards" by U.S. courts, (b) an application of a study of awards by European courts that lacks the nuance about attributes of awards emphasized in the study, and (c) a heroic extrapolation from awards in largely single-plaintiff cases to a Class-wide damages estimate encompassing thousands of putative Class members.

8. In addition to the deficiencies outlined above, the Shefftz Report contains numerous instances of errors, making it difficult to glean the points attempting to be made.

9. I reserve the right to offer additional opinions at a future date.

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II. THE SHEFFTZ REPORT'S COUNT OF PUTATIVE CLASS MEMBERS IS ERRONEOUS

10. Based on the Shefftz Report, putative Class members are inmates housed in Unit 29 or Unit 32 of MSP at some point between January 1, 2018, and February 29, 2020. In my report this same time period is used without any opinion as to whether it is the appropriate one.
11. The Shefftz Report relies on two “Mississippi Department of Corrections printouts for unique listing of inmates housed at Units 29 and 32, between January 1, 2018 and February 29, 2020.”³ These lists show that a total of 3,994 inmates were housed at either Unit 29 or Unit 32 for some length of time (perhaps as little as one day) between January 1, 2018, and February 29, 2020. 3,482 inmates were housed in Unit 29 but not Unit 32, 13 inmates were housed in Unit 32 but not Unit 29, and 499 inmates were housed in both Unit 29 and Unit 32 at some point over this time period. And so the maximum number of inmates who were housed at Unit 29 and/or Unit 32 for some period of time from January 1, 2018 through February 29, 2020 is 3,994. At various points the Shefftz Report uses a multiplier of 4,493 in extrapolating to purported Class-wide damages, erroneously assuming there could be 4,493 putative Class members.
12. Even if one assumes the Class period as defined in the Shefftz Report is correct, which Defendants dispute, the Shefftz Report is in error. Applying a multiplier of 4,493 to extrapolate to Class-wide damages is not in error solely to the extent that 4,493 is greater than 3,994. Additionally, the Shefftz Report implicitly assumes that all purported Class

³ Section 2, p5 of Shefftz Report.

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members have suffered injuries entitling them to damages, whereas the count of purported Class members so injured is likely much smaller. Indeed, the 14 named Plaintiffs, who are purported Class representatives, are barred from recovering compensatory damages “because they did not allege any physical injury.”⁴

III. THE SHEFFTZ REPORT’S LIST OF INMATES’ RELEVANT ATTRIBUTES IS INCOMPLETE

A. Relevant Inmate Attributes for Distributing Damages Among Putative Class Members

13. The Shefftz Report claims that “money damages can be calculated accurately on [sic] based on only four inmate-specific attributes”. These attributes are (i) gender, (ii) death vs injury, (iii) date of birth, and (iv) expected release date. Since no female inmates are or were housed at MSP, gender as an attribute is moot.
14. The Complaint does not allege the number of inmates who died as a result of the alleged misconduct. It also does not allege the number of inmates who suffered sufficient injury to prevent them from obtaining employment post-release. In fact, as noted above, the Court has held that the Plaintiffs failed to allege that they have suffered any physical injury because of the Defendants’ conduct.

⁴ Order and Memorandum Opinion, March 22, 2023.

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15. Inmates in Unit 29 were housed in twelve separate buildings, each with two zones. Similarly, Unit 32 inmates were housed in different zones. The Shefftz Report fails to consider where inmates were housed, when, and for how long -- all important inmate attributes for developing a damages methodology that can accurately identify inmates who were injured and may be entitled to pecuniary or non-pecuniary damages.
16. Section IV below details deficiencies in the Shefftz Report's methodology for computing pecuniary damages. One of these deficiencies is that several other inmate attributes not detailed in the Shefftz Report -- education level, offender type (violent versus drug), recidivism, type and length of sentence, and time served among them -- are required to sensibly estimate pecuniary damages.

B. Relevant Inmate Attributes for Allocating Damages Among Defendants

17. A separate concern is the distribution of any damages amounts from specific putative Class members to specific Defendants. This likewise requires knowledge of when, where, and for how long, inmates were housed in Unit 29 and/or Unit 32.

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IV. DEFICIENCIES IN THE SHEFFTZ REPORT'S METHOD OF COMPUTING PECUNIARY DAMAGES

18. The Shefftz Report attempts to develop a methodology for computing pecuniary damages.

This methodology is unreliable since it invokes multiple assumptions that are not credible, as outlined below.

A. Expected Release Dates are Not Available

19. The Shefftz Report's methodology for computing pecuniary damages has as a key input "Expected Release Date". However, inmate release dates are "Tentative", meaning they are not certain or fixed.⁵ In addition, there are no listed Tentative Release Dates for inmates serving life sentences. Of the 14 named Plaintiffs, five of them are serving life sentences.

B. Worklife Estimates are Based on Noncredible Assumptions

20. The Shefftz Report uses data reported in Skoog et al⁶ (the "Skoog data") as the basis for estimating the worklife of inmates post-release. The Shefftz Report acknowledges that it "offers many options for fine-tuning the worklife expectancy based on different individual

⁵ MDOC Inmate Records 000892-913, https://www.mdod.ms.gov/inmate_search/getDetails/M2789 (referring to "Tentative Release Dates")

⁶ "The Markov Model of Labor Force Activity 2012-17: Extended Tables of Central Tendency, Shape, Percentile Points, and Bootstrap Standard Errors," by Gary R. Skoog, James E. Ciecka and Kurt V. Krueger, *Journal of Forensic Economics*, 28 (1-2), 2019.

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attributes.”⁷ However, in applying this methodology the Shefftz Report both (i) uses incorrect attributes, and (ii) makes assumptions about unknown attributes that introduce a large degree of approximation error.

21. The Shefftz Report applies the Skoog worklife data for men initially in the labor force. Skoog data are also available for men who are initially not in the labor force. US Department of Justice data⁸ (“DOJ data”), relied upon in other instances in the Shefftz Report, show that, for persons released from Federal prison in 2010 fewer than 15 percent were employed during the quarter in which they were admitted to prison.⁹ So clearly the assumption in the Shefftz Report that putative Class members are initially in the labor force is a noncredible one. And even for the 15 percent who were employed prior to admission to Federal prison, assuming they are initially in the labor force upon their release does not necessarily represent an appropriate assumption.

22. Table 1 below shows the median worklife from the Skoog data for 30-year-old and 40-year-old men with various levels of education, both for those initially in the labor force (“Active”), and those initially not in the labor force (“Inactive”).

⁷ p7 of Shefftz Report.

⁸ “Employment of Persons Released from Federal Prison in 2010,” *U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics*, by E. Ann Carson, Daniell Sandler, Renuka Bhaskar, Leticia Fernandez, and Sonya Porter, 2021.

⁹ Fig. 6, p16 of DOJ Report.

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Table 1: Median Worklife for Men in Years
(by age, initial labor force status & education level)

Age	Initial Labor Force Status	Education level				Difference between GED & No Education through 9th Grade
		No Education through 9th Grade	10th Grade to 12th Grade, No Diploma	GED	High School Diploma	
30	Active	23.5	23.5	24.5	29.5	1.0
	Inactive	19.5	20.5	23.5	27.5	4.0
40	Active	16.5	16.5	17.5	21.5	1.0
	Inactive	10.5	12.5	14.5	17.5	4.0

23. Consider 30-year-old men with a GED. The median worklife is 24.5 years for those initially active in the labor force versus 23.5 years for those initially inactive. For 40-year-old men with a GED, this median worklife disparity is even greater, at 17.5 years versus 14.5 years.

24. The Shefftz Report also claims that its methodology does not require one to precisely observe education level. Rather it assumes all inmates have a GED and states that the resulting median worklife “shows only a slight increase among men without either a GED or high school diploma”.¹⁰ While it is true that this increase is only 1 year for 30-year-old and 40-

¹⁰ p7, Shefftz Report.

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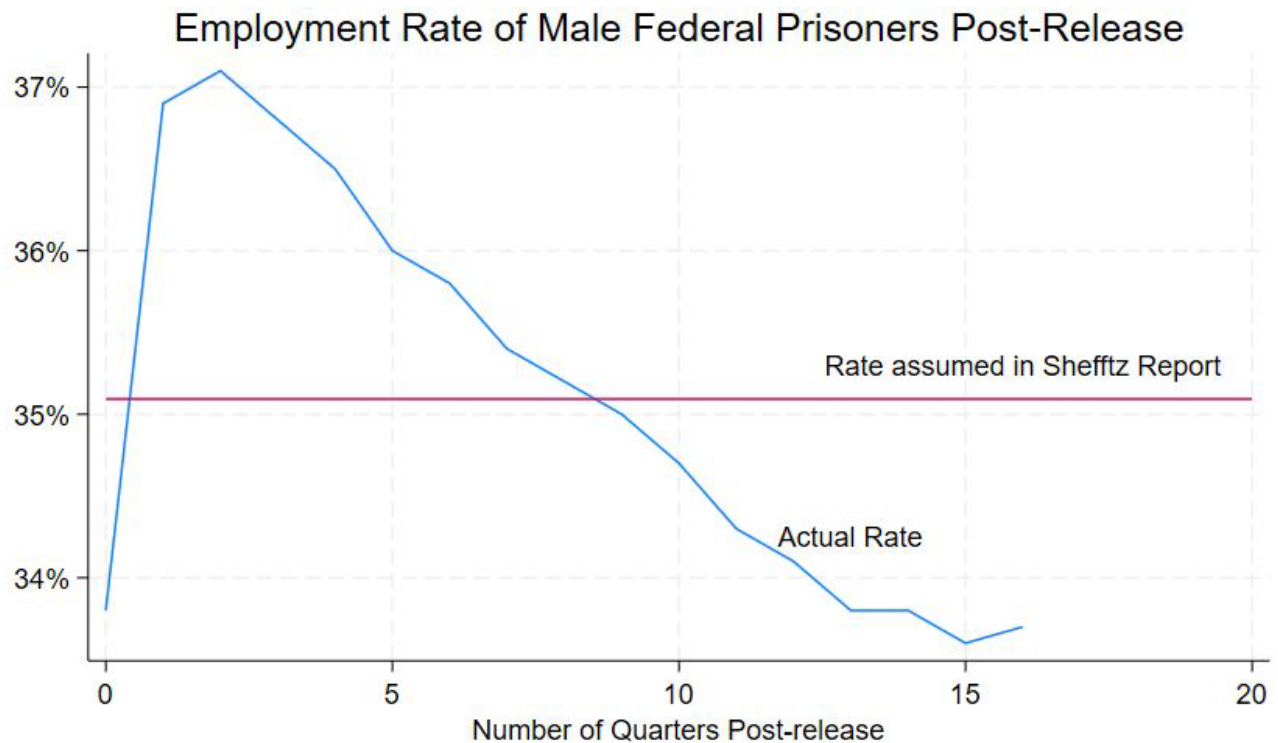
year-old men initially in the labor force, for those men not initially in the labor force, the increase is in fact 4 years.

25. And note that there is a 7-year difference (17.5 years versus 10.5 years) in median worklife between 40-year-old men with a GED who are initially active in the labor force and 40-year-old men with a 9th grade education who are initially inactive in the labor force. The Shefftz Report rather severely underestimates the magnitude of the approximation error incurred by assuming all inmates have a GED.

C. The Post-Release Employment Rate Assumption is Not Credible

26. The Shefftz Report attempts to use the DOJ data to compute average employment rates post-release. However, Figure 1 below shows the employment rate for males over time post-release, as well as the average employment rate assumed in the Shefftz Report. Note that, after an initial spike in the first two quarters, the average post-release employment rate proceeds to continuously decline. The Shefftz Report assumes, for the entire worklife, a constant employment rate of 35.1 percent for inmates post-release. So, for example, with 30-year-old men, for whom the Shefftz Report assumes a worklife of 24.5 years -- 98 quarters -- the employment rate assumed is 35.1 percent over all 98 of these quarters. This assumption is at odds with the empirical pattern of employment rates over time contained in the DOJ data and illustrated in Figure 1.

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Figure 1

27. Compounding this problem, the Shefftz Report ignores recidivism rates, even though the DOJ data includes recidivism rates. The DOJ data show 19.3 percent of Federal prisoners released in 2010 were Federally reimprisoned within 4 years. And, of course, this does not account for any future incarcerations in non-Federal prisons.

28. Of additional concern is that the DOJ data reports large variability in employment rates dependent on race, time served and offense type. Given that these results are reported in Table 5 of the DOJ data, which the Shefftz Report specifically refers to, it is more than a little curious that they are not regarded as relevant inputs to the methodology.

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D. Assumption of Working Full-Year Full-Time is Not Credible

29. The Shefftz Report assumes inmates who are employed post-release work 40-hours per week, 52 weeks per year, for a total of 2,080 hours of work per year. Additionally, these hours are assumed to be worked at the Federal minimum wage. This is not credible. A recent comprehensive study of low-wage workers by the Brookings Institute¹¹ reports that only 57.4 percent of low-wage workers work full-time year-round, in contrast to 81.4 percent of mid-to-high wage workers.

E. Assumed Self-Consumption Rate is Not Credible

30. In attempting to develop a pecuniary damages methodology, the Shefftz Report assumes a self-consumption rate of 78.53. This rate comes from Table 5-1 of Stephenson and MacPherson (2021),¹² and is not conditional on income level. Paying attention to income is important, as one might certainly expect higher self-consumption rates for lower income individuals.

31. Consumer Expenditure Survey data¹³ may be examined to observe consumption patterns by income. For the bottom decile and the second-bottom decile of the income distribution – that is for the lowest 20 percent of income earners, consumption in fact exceeds income. Since the

¹¹ Martha Ross, Nicole Bateman & Alec Friedhoff, *Meet the Low-Wage Workforce*, Brookings Institute, 2020.

¹² *Determining Economic Damages*, Stanley Stephenson and David MacPherson, James Publishing, 2021.

¹³ Consumer Expenditure Surveys, U.S. Bureau of Labor Statistics, September 2023.

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Shefftz Report assumes inmates earn the minimum wage post-release, a focus on this bottom 20 percent of the income distribution is appropriate. And so the self-consumption assumption invoked in the Shefftz Report is not credible.

F. Impact of COVID-19 on the Low-Wage Workforce

32. The empirical data referred to in all the references in the Shefftz Report were all compiled prior to the COVID-19 pandemic. Economic analysis of the pandemic has definitively shown a resulting large negative impact on the low-wage employment sector.¹⁴ The failure to address the impact of COVID-19 on the employment prospects of inmates post-release is an additional blow to the credibility of the Shefftz Report.

V. DEFICIENCIES IN THE SHEFFTZ REPORT'S METHOD OF COMPUTING NON-PECUNIARY DAMAGES

33. The Shefftz Report attempts to set forth two methodologies for monetizing non-pecuniary damages, (i) by reference to “awards” by U.S. Courts, and (ii) by reference to awards by the European Court of Human Rights. Both of these methodologies are flawed.

¹⁴ See, for example, Guido Matias Cortes & Eliza Forsythe, “Heterogeneous Labor Market Impacts of the COVID-19 Pandemic”, *ILR Review*, vol.76(1), pp30-55, 2023.

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A. “Awards” by U.S. Courts

34. Table 2 in the Shefftz Report lists four “awards” by U.S. Courts for non-death cases. These “award” amounts were \$1,500, \$7,500, \$25,830 & \$29,500. Despite these modest award amounts, the Shefftz Report in Table 3 extrapolates from these “awards” to an estimate in excess of \$35,000,000 in Class-wide non-pecuniary damages.

35. One of the cases illustrated in Table 2 was a “slip & fall” case involving descending a concrete stairwell with inadequate lighting.¹⁵ The Shefftz Report makes no attempt to explain how that \$7,500 award is relevant to this case.

36. Another case in Table 2 involved a settlement – not an award by a court or a jury -- to be shared equally among six plaintiffs.¹⁶ The Shefftz Report makes no attempt to explain how that \$25,830 settlement is relevant to this case.

37. A third case¹⁷ illustrated in Table 2 involved a remittitur of punitive damages, not an award of non-pecuniary damages. So it does not provide an appropriate point of comparison for the damages methodology in the Shefftz Report.

¹⁵ Michael Roberts v. Ohio Department of Rehabilitation and Correction.

¹⁶ Matthew Everhart, Robert Fisher, Shawn Laverty, Thomas Piscotty, Jack Asencio, and Jeffrey Bissonnette v. Board of Chosen Freeholders of the County of Sussex, Office of the Sussex County Sheriff and Robert Uuntig, individually and in his official capacity of Sussex County Sheriff, the State of New Jersey, 2009.

¹⁷ Townsend v. Allen.

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38. If one excludes the above three cases we are left with one injury case in Table 2, a single-plaintiff matter with an award of \$1,500.¹⁸ This suit was against the state, not individual defendants, and the plaintiff's specific, individual situation led the court to enter the award. The Shefftz Report makes no effort to explain how this \$1,500 award is relevant to this case.
39. Table 3 in the Shefftz Report takes the award data from Table 2 and extrapolates to estimate a Class-wide non-pecuniary damages amount of \$35,297,008. It does this by erroneously counting the number of inmates held in either Unit 29 or Unit 32 as 4,493. The correct number of inmates held in either of these two units between January 1, 2018, and February 29, 2020, is 3,994. Additionally, the number of inmates who suffered an injury entitling them to a non-pecuniary damages award, is likely much smaller than 3,994, possibly 0. Moreover, the Shefftz Report fails to address the allocation of any damage amounts from specific putative Class members to specific Defendants.

B. Applying a Study of Awards by the European Court of Human Rights

40. Table 4 of the Shefftz Report uses a per-Plaintiff damage award of €3,000 as its second basis for extrapolating to Class-wide non-pecuniary damages. This is the median damage amount reported in the Altwicker-Hamori study of European awards.¹⁹ Although this study does list €3,000 as the median non-pecuniary damage award, its focus is on the variability of

¹⁸ DeAngelo v. State of New York

¹⁹ "Measuring Violations of Human Rights: An Empirical Analysis of Awards in Respect of Non-Pecuniary Damage under the European Convention on Human Rights," *Zeitschrift für ausländisches öffentliches Recht und Völkerrecht [Heidelberg Journal of International Law]*, by Szilvia Altwicker-Hamori, Tilmann Altwicker, and Anne Peters, 2016, 76(1):1-51.

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individual awards, and the correlation of these award amounts with various features of the human rights violation, such as (i) the seriousness of the violation, (ii) the age, nationality and gender of the victim, and (iii) whether or not the Court made a unanimous decision in the hearing. The Shefftz makes no mention that these features would have to be observed for each MSP inmate in the purported Class.

41. Additionally, the data in the Altwicker-Hamori report come from 543 alleged cases of human-rights violations involving 587 victims. This implies that, at the very least, 452 of the 587 victims (at least 77 percent) received awards in “single-Plaintiff” cases. Extrapolating these cases to produce a Class-wide damages estimate by simply assigning a €3,000 award to each purported Class member is problematic to say the least.

42. The Shefftz Report also commits the same error in Table 4 that it does in Table 3 -- using a multiplication factor of 4,493 in its extrapolation exercise, despite the fact that there are at most 3,994 purported Class members. And the Shefftz Report fails to address the allocation of any damage amounts from specific putative Class members to specific Defendants.

VI. THE SHEFFTZ REPORT CONTAINS OTHER ERRORS

43. In addition to the above critiques, the Shefftz Report contains many errors, making its main points quite difficult to disentangle.

44. For example, Table 1 contains several basic errors. Row 2 shows Jane Doe to have a date of birth of 1-Jan-1990 and an expected release date of 1-Oct-2025, making her 35 years old upon

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her expected release. But Table 1 erroneously reports her age at her expected release date as 36. And, indeed, the inclusion of a female in Table 1 is superfluous, as there are no females in the purported Class.

45. Further, the description of self-consumption in Column (k) of Table 1 is nonsensical. This column is footnoted twice, and the second footnote says, in essence, that the self-consumption rate for a deceased Class member equals his employment rate minus his self-consumption rate (a circular reference) plus his age divided by 365.25.

46. And in Table 3 and Table 4 of the Shefftz Report, extrapolations to Class-wide damage amounts apply a multiplication factor that erroneously assumes the number of purported Class members is 4,493. As mentioned above, the correct number is at most 3,994.

VII. CONCLUSION

47. For all of the reasons discussed above, the Shefftz Report's purported methodologies for computing Class-wide damages are unreliable and fundamentally flawed.

Curriculum Vitae

PHILIP J. CROSS, Ph.D.

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SUMMARY

Dr. Cross has over 20 years' experience as an economist and statistician in academia, government, and consulting. His consulting experience includes being a testifying expert in a large class-action litigation involving health-care provision reimbursement, writing expert reports and testifying in class action matters, antitrust matters, lost wages matters, breach-of-contract matters, regulatory matters, and analyzing the compensation structure for equity partners in large professional services firms. In addition, Dr. Cross has considerable experience providing expert support in class actions and antitrust cases as well as general consulting for businesses, governments and non-profits.

EDUCATION

Ph.D., Economics, University of Wisconsin
M.A., Economics, University of Wisconsin
B.Com. (Hons.), Economics, University of New South Wales

PRESENT EMPLOYMENT

Kenyon Consulting, LLC, Founder and Principal

AFFILIATE POSITION

BVA Group, Senior Advisor

PREVIOUS CONSULTING POSITIONS

AlixPartners, LLP, Director, 2016-2019
Berkeley Research Group, LLC, Senior Managing Economist, 2013-2016
Exponent, Inc., Managing Economist, 2012-2013
Deloitte Financial Advisory Services, Managing Economist, 2009-2012
Department of Defense, Office of Comp., Personnel & Policy, Consultant, 2003-2004

EXPERT EXPERIENCE

- Expert witness for plaintiffs in a class-action litigation between probationers and a private probation company. Probationers' due process rights were allegedly violated when the company unilaterally extended the duration of probationers' sentences and increased the fines they owed so as to continue collecting monthly fees. Written expert report, and

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deposition testimony, calculating economic damages incurred from additional review hearings and office visits, as well as lengthen probation terms.

- Expert witness for defendant in a class-action litigation between a health insurer and a group of health-care providers over alleged claim under-reimbursement. Submitted an expert report outlining flaws in plaintiff expert's proposed method of ascertaining the class, by illustrating how data available to plaintiffs' expert fall short of accurately identifying which health-care providers are class members.
- Expert witness for defendant in a class-action litigation between a telecommunications company and end users over alleged privacy violations occurring when using telephone number masking technology. Critiqued plaintiffs' expert's class ascertainability assertions and damage estimates by illustrating how nuances in the direction of call routing affects class members' injury, or lack thereof.
- Retained as an expert witness for defendant in an antitrust litigation between a large automotive manufacturer and one of its suppliers. The expert report refutes the plaintiff expert's claim that sales data empirically support the allegation that the parts supplier conspired to raise prices over a six-year period. The plaintiff expert's empirical analysis employs an overly simplistic and flawed model of pricing dynamics. By employing a superior empirical analysis, with much improved modelling of price dynamics, sales data are seen to contain no statistically supportable evidence of a conspiracy.
- Retained as an expert in a petition to allow an entry into a local jurisdiction of an additional trash hauler to compete with the existing monopoly provider of trash-hauling services. Comparing the economics of trash hauling, both on the supply and the demand side, that in similar jurisdictions demonstrates the benefits of allowing the entrant outweigh the costs.
- Retained as an expert in a major, ongoing class-action litigation involving an alleged antitrust violation. Provided rigorous empirical analysis showing that defendants are liable, and produced preliminary damages estimates to assist plaintiffs in their settlement negotiations with the defendants.
- Expert witness for defendant in a gender-discrimination dispute between an oil services firm and two former employees. Wrote an expert report arguing that the experiences of the two plaintiffs differed substantially in several dimensions, undermining the plaintiffs' claims that the commonality requirement of Federal Rule 23(a) could be satisfied in an attempt to certify a class. One plaintiff subsequently exited the litigation, and the remaining plaintiff no longer pursued a class action claim.
- Expert witness for the defendant in a breach of contract litigation between two firms providing technology to facilitate charitable giving. Submitted an expert report rebutting plaintiff expert's estimated damages due to lost profits. The plaintiff expert's forecast of future profits used a flawed statistical model that produced unreliable forecasts. The forecasts also assumed non-credible profit margins and product life cycles.
- Retained as an expert in multiple employment discrimination (due to age, gender, race and/or health status), wrongful death, and personal-injury matters. Written opinions and deposition and trial testimony estimating the economic damages over a working life due to lost wages, basing projections of future earnings on recent income and educational history and the volatility/stability of recent income streams.

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- Expert witness for the plaintiff in a lost wages and lost profits matter involving a breach of contract and employment discrimination. Plaintiff was a co-founder and employee of a large and rapidly expanding medical practice. Submitted an expert report and testified in deposition as to the plaintiff's resulting loss of wages and loss of profits.
- Retained as a consulting expert to provide economic analysis of the compensation structure for equity partners at a large professional services firm. Combining pay stub data with accounts receivable data, hourly billings data, and other performance measures affords the estimation a regression model of compensation as a function of productivity. This model can be employed to show the absence of gender- and age-discrimination in compensation and promotion policies.

CLASS-ACTION LITIGATION EXPERIENCE

- Expert-witness support in a class-action litigation between a group of blue-collar workers and their former employer, a large manufacturer. Summarizing pay-stub level data as a panel dataset, organized by monthly pay and worker, allows for empirically testing and rejecting several assumptions employed by the plaintiff expert in computing alleged damages.
- Expert-witness support in a class certification matter between a large financial services firm and a number of its entry-level employees. By analyzing raw, time-stamped data, several of plaintiffs' expert's claims were shown to be exaggerated to the point of being invalid. Analysis of the data revealed substantial variation between proposed class members with respect to liability, indicating a need for individual inquiry. In addition to proposed class member liability issues, analysis of the firm's internal data revealed a degree of measurement error.
- Expert-witness support in a class-action litigation between a group of landowners/mineral rights holders and several mining companies over alleged royalty underpayments. A sampling scheme design and implementation draws a representative sample of deeds for examination.
- Expert-witness support in a class-action litigation between a large auto manufacturer and its customers over allegedly defective in-car technology. Assist in designing and implementing a survey to measure customers' willingness-to-pay for various car-interior add-ons, including in-dash technology.
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ANTITRUST LITIGATION EXPERIENCE

- Expert witness support in an antitrust litigation between a large automotive manufacturer and one of its suppliers over an alleged price-fixing conspiracy. By using a differences-in-differences approach to compare the average unit price in the alleged conspiracy period with that in the non-conspiracy period, the absence of a statistically significant increase in prices can be shown. Plaintiffs' expert's analysis critiqued for identifying the conspiracy period in part by examining patterns of price movements, and then proceeding to use these same price data to allege evidence of a conspiracy.
- Expert-witness support in an antitrust dispute between competing installers of residential solar panels. Regression analysis shows evidence of labor-market manipulation whereby the entering firm faces higher labor costs in geographic markets with a large presence by the incumbent. This input-cost effect coincides with supra-competitive pricing by the incumbent.
- Assisting an oil refiner with a proposal to purchase a recently shuttered small refinery from a competitor. Concerns raised by the Federal Trade Commission about potentially anti-competitive effects of the purchase need addressing. By comparing oil prices in distinct geographic regions before and after the shuttering of the refinery, it can be shown that potentially anti-competitive effects of the refiner owning one more refinery are more than offset by the supply effects of having the shuttered refinery re-open. Further, estimating the effect of market demand as a function of geographic proximity to the refinery shows that the refiner's market concentration, properly defined geographically, would increase negligibly with the refinery purchase.
- Expert-witness support in an antitrust dispute between a large vegetable growers' collective and a large wholesaler over alleged price fixing via artificial suppression of supply. By building a microeconomic model of supply and demand and populating the model with years' worth of data from several disparate sources, it can be shown that the alleged artificial supply restrictions are too small a share of the overall market to allow for substantive anti-competitive behavior. Further, plaintiffs' expert's analysis can be effectively critiqued for using poor data that are not sufficiently disaggregated. Regression analysis results are shown to be sensitive to the disaggregation of data down to a monthly frequency, regional market and distinct vegetable type.

LABOR ECONOMICS LITIGATION EXPERIENCE

- Expert-witness support in employment-discrimination and wrongful-termination litigations. Damages from lost wages are computed by forecasting future pay but-for the termination based on historical pay trajectories. Damages from reduced value of stock options, due to (i) the expiration of unvested options, (ii) forced exercising of vested options, and (iii) loss of potential options in the future.
- Expert-witness support in wrongful death and personal injury litigations. Forecasting lost wages is possible by constructing estimates of the present value of counterfactual wage earnings of the alleged economically damaged party using historical employment and pay records. Consortium claims damages are likewise estimated by forecasting the value of household and familial roles based on relevant demographics.

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STATISTICAL ANALYSIS LITIGATION EXPERIENCE

- Expert-witness support in a trade-secrets dispute between two manufacturers of steel products. The allegation that the defendant firm used improperly obtained balance sheet information about the plaintiff to win a disproportionate number of job bids against the plaintiff was successfully rebutted by showing statistically insignificant changes in bidding behavior of the defendant before and after the alleged accessing of trade secrets.
- Expert-witness support in a *qui tam* case involving alleged over-billing to Medicare, Medicaid and Tricare by an operator of dozens of skilled nursing facilities (SNFs). Assessing the Relator expert's proposed methods of sampling SNF billing records reveals numerous flaws. Proposing an improved sampling scheme yield a more representative and less biased sample than that proposed by Relator expert.
- Assisting in settlement negotiations between a large regional health-care provider and the U.S. Department of Justice over alleged Medicare over-billing. By exposing flaws in sampling method employed by the Department of Justice, a superior method, based on stratified sampling and appropriate sample weights, can be designed and implemented.
- Designing a sampling scheme to draw a representative sample of defense contracts awarded to a major U.S. manufacturer to satisfy a request from the Defense Contract Audit Agency.

GOVERNMENT CONTRACT DISPUTE EXPERIENCE

- Assisting an energy supplier in a *qui tam* dispute with a state government involving alleged over-pricing of energy contracts. By performing a sensitivity analysis comparing different potential definitions of the daily market price, and different definitions of volatility, alleged damages can be shown to be much smaller than claimed by the relator's expert.
- Expert-witness support in a government contract bid protest by a large health insurer, providing analysis of current financial statements and also an analysis of assumptions underlying growth projections.

OTHER LITIGATION EXPERIENCE

- Expert-witness support in litigation against a large health insurance company by an ambulatory surgical center over alleged claim of under-reimbursement.
- Expert-witness support in litigation against an ambulatory surgical center by a large health insurance company over alleged over-billing. A representative sample of similar claims was identified and obtained, illustrating multiple instances of abnormally high billed charges by the ambulatory surgical center.
- Expert-witness support in a litigation between a city government and a large bank over allegedly abusive mortgage lending practices targeted at African American customers and housing in predominately African American neighborhoods. Mortgage-application data from the bank were used to apply a formal test showing that, after accounting for usual indicators of credit risk, the additional factor of race did not have statistically significant effect on mortgage terms.

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- Expert-witness support in a litigation between a government securities regulator and a large bank over alleged interest rate rigging. Data on individual trades was combined with data on daily movements in key interest rates to argue that trading behavior on alleged rate-rigging days did not appear to be abnormal.
- Expert-witness support in a lawsuit between two telecommunications companies over alleged re-routing of international calls to bypass the mandated switch. By comparing call volumes with the number of mobile phone subscribers, and estimate of bypassed calls and corresponding economic damages was computed.
- Expert-witness support in a large set of consolidated product liability lawsuits against the manufacturer of a medical device. A Monte Carlo statistical simulation was designed and implemented to determine the feasible range of settlement payments.
- Expert-witness support evaluating claims of unfair competition, false advertising, and unfair trade practices when providing confirmatory urine drug testing for pain-management healthcare practitioners.
- Expert-witness support in a criminal matter involving alleged stock-price manipulation by a CFO. An event-study analysis was performed to identify the presence or absence of statistically significant abnormal returns on alleged manipulation days.
- Expert-witness support in a litigation between a major retailer and financial services companies over a data-breach resulting from credit and debit card use at the point of sale. Constructed a representative sample, by applying stratified-sampling weights, of breached transactions to assess the incidence of fraud.
- Assisting a national insurance company in a dispute with the Department of Justice over allegedly fraudulently altered crop insurance policies. A statistically representative stratified sample of policies was constructed for audit review, and an econometric scoring model was applied.
- Expert-witness support performing a regression analysis to estimate the amount of cost pass-through resulting from incorporating inputs allegedly subject to price fixing.
- Developing an economic model supporting an expert opinion on consumer costs resulting from the Environmental Protection Agency implementation of a risk mitigation decision related to certain rodenticide products.

NON-LITIGATION CONSULTING EXPERIENCE

Private Sector

- Assisting a large network of hospitals more accurately forecast their accounts receivable for outpatient expenses. Summarizing claim-level data as a panel dataset, organized by month and patient, allows for regression analysis to be employed, thereby exploiting the value to forecasting of such variables as insurer, patient's relationship to the insured, and the size of the bill. Forecast accuracy improves by correcting for over-selection of more rapidly paid bills.
- Providing privileged consulting services for several-professional services firms. Tasks include analyzing compensation structures for equity partners and senior management for

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evidence of potential age or gender discrimination. Other tasks include analyzing existing policies linking performance metrics to compensation and promotion decisions, and advising on optimal performance-compensation mechanisms.

- Building and applying a regression model to more accurately predict the fraction of loyalty points that will eventually be redeemed by participants in a major airline loyalty program. Summarizing transaction-level data (on over 50 million transactions) in a panel dataset, organized by year and participant, allows for regression analysis to yield more accurate forecasts.
- Assisting in estimating a demand model for pay-phone calls in a dispute between pay phone operators and a large telecommunications firm.
- Assisting in the forensic examination of stock trading by a stock-trading firm allegedly not acting in the best interests of its client.
- Constructing a simultaneous-equations regression model to estimate the disaggregation of costs into various depreciation categories for a major U.S. retailer.

Government

- Building and applying an econometric model to assist a Western European government more accurately forecast repayment rates for its student-loan program. Since loan repayments are administered via the income-tax system, the model estimates income growth and volatility for differing categories of college graduates. From individual tax records a panel dataset, organized by annual income and graduate, can be constructed and matched to a large government-sponsored panel.
- Modeling the economic incentives impacting the enlistment and retention of military members. By linking administrative data on retention with survey data measuring job satisfaction, a regression model can be developed exploiting survey data as an accurate leading indicator of reenlistment behavior.
- Assisting in the writing of a report for the Department of Labor critiquing the predictive abilities of various pension forecasting models.
- Assisting in the writing of a report for the Department of Labor highlighting the liability exposure of U.S. publicly traded companies to legacy health-care costs for retired workers.
- Assisting in the writing of a report for the Department of Labor's Employee Benefits Security Administration summarizing the risk and reward profiles of target-date mutual funds.
- Forensically analyzing time reports to investigate alleged over-charging of time by employees of a major military contractor in Iraq.

ACADEMIC EXPERIENCE

Georgetown University, Department of Economics, Assistant Professor, 2001-2008
Undergraduate Microeconomics

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Undergraduate Statistics
Undergraduate Econometrics
Graduate Econometrics
Johns Hopkins University, Department of Economics, Visiting Assistant Professor, 2002
Graduate Econometrics
Melbourne University, Department of Economics, Visiting Scholar, 2002-2004

ACADEMIC PUBLICATIONS

Regressions, short and long (with Chuck Manski), *Econometrica*, 2002.

Of mice and men: Within gender variation in strategic behavior (with Marco Castillo), *Games and Economic Behavior*, 2008.

Nonparametric utility theory in strategic settings: Revealing preferences and beliefs from proposal-response games (with Marco Castillo & Mikhail Freer), *Games and Economic Behavior*, 2019.

PROFESSIONAL AFFILIATIONS

Member of the American Bar Association
Member of the American Economic Association
Member of the American Statistical Association
Member of the Econometric Society
Member of the National Association of Forensic Economics

Philip J. Cross, Ph.D. – Last four years' testimony

Testimony in L&L Site Services, Inc.'s Application for Certificate of Public Convenience, Department of Public Service Regulation Before the Public Service Commission of the State of Montana, Docket No. 2018.03.006 (T-18.6.PCN), (2021).

Deposition testimony in Zenergy Systems, LLC v. Everi Payments Inc., Eighth Judicial District Court, Clark County, Nevada, Case No.: A-20-815759-B, (2022).

Deposition testimony in Harper, et. al. v. Professional Probation Services, Inc., US District Court for the Northern District of Alabama, Case No. 2:17-CV-1791-ACA, (2022).

Deposition testimony in Cheatham v. Schlumberger Technology Corporation, US District Court for the Southern District of Texas, Houston Division, Case No. 4:20-cv-02193, (2023).

Deposition testimony in Wallis v. National Rural Utilities Cooperative Finance Corporation, US District Court for the Eastern District of Virginia, Case No. 1:22-cv-00838 (PTG/WEF), (2023).

Deposition testimony in Edwards v. Tucker Auto-mation of NC, LLC, State of NC, Wake County in the General Court of Justice, Superior Court Division, Civil Action No. 19-CVS-15654, (2023).

Trial testimony in Cheatham v. Schlumberger Technology Corporation, US District Court for the Southern District of Texas, Houston Division, Case No. 4:20-cv-02193, (2023).

Testimony in Abdulaal v. Alberta Association of Architects, Alberta Human Rights Commission, Complaint No.: N2019/05/0070 (2023).

Deposition testimony in Kasperek v. Inova Health Care Services and Commonwealth Emergency Physicians, US District Court for the Eastern District of Virginia, Alexandria Division, Case No. 1:22-cv-001395-PTG-WEF (2023).